Ozone Technology Applications RESEARCH REPORT

Ozone as an Aqueous Disinfectant

Goal: To research the efficacy of ozone as a replacement or adjunct to available disinfectants and fungicides used during post harvest treatment of fresh fruits and vegetables.

Technology Path: Ozone has the technical potential to be an effective quality control measure in several packing and processing processes. These include hydrocoolers, dump tanks, cleaning operations, and fungicide dips or sprays. At the completion of this task the researchers expect the technology to be ready for commercialization of ozone as an aqueous disinfectant in fresh produce. Additional practical applications for other fruits and vegetables that are not addressed under the current research may be needed, with each application requiring only several weeks to demonstrate and refine. Currently, the technology of ozone as an aqueous disinfectant is known to the agricultural industry only on a limited basis. This research effort by USDA will accelerate the commercial deployment schedule for this technology.

Energy Efficiency Benefits: Potential energy benefits from this research include the replacement of hazardous and potentially harmful chemicals, as well as the development of energy efficient ozone application practices. Replacing these disinfectant chemicals with ozone at all 330 packing operations in California (including citrus and stone fruit) can increase power usage by 7,260 kWh per day.

Although ozone will increase energy consumption, food wholesalers will adopt the technology to stay competitive in export markets demanding alternatives to chemical fumigation.

Technical Objectives:

Demonstrate ozone potential in fruit and vegetable packing or storage operations as a means to reduce or eliminate populations of pests and fungi that could reduce the quality of these commodities; reduce or replace fungicides and biocides that have food residue concerns; reduce problems associated with discharge of effluents from processing facilities and packing houses; and develop best management practices to achieve higher energy efficiency.

Economic Objectives:

Achieve sufficient energy and other production-cost savings to reach a positive return on investment for the proposed ozone system.

Principal Investigator: Dr. Joe Smilanick, researcher with the USDA/ARS is the project manager.